

**IN THE CLAIMS**

Please cancel claims 1-54 and add the new claims listed below:

Claims 1-54 (Cancelled)

55. (New) A method of assessing the effectiveness of pulmonary drug delivery, comprising the steps of:
- a) providing a drug into an air flow past a sensor comprising a radiation source and a radiation detector;
  - b) detecting, at the radiation detector, incident radiation over a period of time as a measurement profile;
  - c) quantifying at least one characteristic of the shape of a measurement profile; and
  - d) producing an indication of the effectiveness of pulmonary drug delivery based upon the at least one quantified characteristic.
56. (New) A method as claimed in claim 55 wherein the indication of the effectiveness of pulmonary drug delivery quantifies the amount of fine particles in the delivered pulmonary drug.
57. (New) A method as claimed in claim 55, wherein the at least one characteristic is a height of the measurement profile or the height of a curve fitted to the measurement profile.
58. (New) A method as claimed in claim 55, wherein the at least one characteristic involves an integration of the measurement profile over its width or the integration of a curve fitted to the measurement profile over its width.
59. (New) A method as claimed in claim 57, wherein an at least one characteristic involves an integration of the measurement profile over its width or the integration of a curve fitted to the measurement profile over its width.

60. (New) A method as claimed in claim 58, wherein the curve fitted to the measurement profile is a dose function which when summed with a level transition residual function substantially re-creates the measurement profile.

61. (New) A method as claimed in claim 59, wherein the curve fitted to the measurement profile is a dose function which when summed with a level transition residual function substantially re-creates the measurement profile.

62. (New) A measurement device for assessing the effectiveness of pulmonary drug delivery, comprising:

- a conduit through which air carrying a cloud of drug particles can flow during drug delivery;

- a radiation source for providing radiation into the conduit;

- a radiation detector for detecting radiation from the conduit over a period of time as a measurement profile; and

- a processor operable to quantify one or more characteristics of the shape of a measurement profile and to produce an indication of the effectiveness of pulmonary drug delivery based upon the quantified characteristic(s).

63. (New) A measurement device as claimed in claim 62, arranged for releasable attachment to a drug dispensing device or integrated within a drug delivery device.

64. (New) A measurement device as claimed in claim 62, wherein the indication of the effectiveness of pulmonary drug delivery indicates the fine particle component of the delivered pulmonary drug.

65. (New) A measurement device as claimed in claim 62, wherein a quantified characteristic is the height of the measurement profile or the height of a curve fitted to the measurement profile.

66. (New) A measurement device as claimed in claim 62, wherein a quantified characteristic involves the integration of the measurement profile over its width or the integration of a curve fitted to the measurement profile over its width.
67. (New) A measurement device as claimed in claim 65, wherein a quantified characteristic involves the integration of the measurement profile over its width or the integration of a curve fitted to the measurement profile over its width.
68. (New) A measurement device as claimed in claim 62 comprising a second radiation detector for detecting radiation from the conduit over a period of time as a second measurement profile, wherein the processor is operable to produce an indication of the effectiveness of pulmonary drug delivery based upon a plurality of measurement profiles for a single drug delivery.
69. (New) A measurement device as claimed in claim 68, further comprising a second radiation source.
70. (New) A method of assessing the effectiveness of pulmonary drug delivery, comprising the steps of:
- recording, during a drug delivery, the output of a first radiation detector against time as a first measurement profile;
  - recording, during the same drug delivery, the output of a second radiation detector against time as a second measurement profile; and
  - processing the first and second measurement profiles to produce an indication of the effectiveness of pulmonary drug delivery.
71. (New) A measurement device for assessing the effectiveness of pulmonary drug delivery, comprising:
- a conduit through which air carrying a cloud of drug particles can flow during drug delivery;
  - a radiation source for providing radiation into the conduit;
  - a first radiation detector for detecting radiation from the conduit over a period

of time as a first measurement profile;

a second radiation detector for detecting radiation from the conduit over the period of time as a second measurement profile; and

a processor operable to produce an indication of the effectiveness of pulmonary drug delivery based upon the first and second measurement profiles.

72. (New) A drug delivery device for providing a drug dose to a user in a plurality of separate drug deliveries, comprising:

a drug metering means for releasing a controlled amount of drug for each drug delivery;

a conduit through which air carrying a cloud of drug particles can flow;

a radiation source for providing radiation into the conduit;

a first radiation detector for detecting radiation from the conduit during a on-going drug delivery as a first measurement profile; and

control means operable to control the drug metering means, for a subsequent drug delivery, in dependence upon at least the first measurement profile.

73. (New) A drug delivery device as claimed in claim 72, wherein the drug metering means is arranged to vary the amount of drug released in a subsequent drug delivery, in dependence upon at least the first measurement profile or is arranged to vary the number of drug deliveries required in dependence upon at least the first measurement profile.